Arctigo ISD

Instruction manual

- Product description
- Product labels
- Unpacking & lifting
- Installation
- Maintenance
- Spare parts

ORIGINAL INSTRUCTIONS

31466441EN-00

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1 Important information

1.1 Disclaimer

This Instruction Manual applies to all Arctigo ISD industrial air cooler products and is supplied in combination with the Air Cooler Product Manual AHE00042. Both manuals must be carefully examined and instructions should be followed up at all times. Alfa LU-VE does not accept liability for any damage resulting from non-compliance to the instructions as given in the manuals and order-related documents.

1.2 Intended use

Air coolers are partly completed machinery according to Machine Directive 2006/42/EC and intended for incorporation in cooling systems.
Declarations of Incorporation are available on alfa.luvegroup.com. The units may not be put into operation until the conformity of the complete machine or cooling system has been declared according to the following standards and directives:

- Pressure Equipment Directive 2014/68/EU
- Machine Directive 2006/42/EC
- Low voltage directive 2014/35/EU
- Electrical Equipment of Machines IEC 60204-1
- Electro Magnetic Compatibility 2014/30/EU
- Any applicable local or national legislation

1.3 Where to find product information

Detailed technical data for individual product models are available in order related documents, on the product label and in product data sheets. Comprehensive technical information for all Alfa LU-VE air heat exchanger products is available on-line on alfa.luvegroup.com. This includes:

- Product manuals
- Instruction manuals
- Product leaflets & brochures
- Product data sheets (selection software)
- Dimensional drawings
- Electrical wiring diagrams
- Certificates

Arctigo ISD

Alfa LU-VE offers world-wide service and support. In case of any questions or uncertainty please contact your local Alfa LU-VE representative.
Contact addresses are available at alfa.luvegroup.com.

2 Product description

2.1 General information and application

Arctigo ISD is a wide and flexible range of single discharge industrial air coolers for both cooling and freezing applications in medium to large cold rooms. This industrial air cooler line has been designed using the Helpman® heritage, to keep fresh and frozen goods refrigerated from +10 to -40 ° C, with either high or low humidity content.

The Arctigo range offers a wide variety of cooler configurations and a long list of options, always allowing to select the best model to suit all applications in industrial refrigeration installations. Arctigo air cooler models are available for dedicated applications such as agricultural storage, air-sock application or shock cooling.

- Refrigerants: HFC, ammonia, brine, CO_2
- Capacity range (SC2): 3 up to 240 kW
- Air volume: 3,000 up to 130,000 m³/h

Refrigerant application	Design pressure
HFC	33 bar
Ammonia	30 bar
CO_2	33-40-60 bar
Brine	10 bar

2.2 Standard configuration

- Finned coil:
  - 10 coil block modules
  - 3, 4, 6, 8 or 10 tube rows deep
  - Tubing ø 5/8”Cu ripple fin, smooth Cu tubing for brine or smooth stainless steel
  - Tube pitch 50 mm square
  - Corrugated Alu-fins
  - Fin spacings 4, 5, 6, 7, 8, 10 and 12 mm
- 1 to 6 Fans, ø 400 mm up to ø 910 mm, drawing trough the coil. Power supply 400/50-60/3 or 230/50-6-/1 (ø 400 and 450 mm), two noise levels (Δ/Y connections).
  AC/EC fan motors with dynamically and statically balanced external rotors, manufactured in accordance with VDE 530/12.84 IP54 class F. Integrated thermo contacts (Clickson) provide reliable protection against thermal overload.
- Corrosion resistant materials: coil frame and casing pre-galvanized sheet steel, epoxy coated RAL 9003. All fixing materials stainless steel.
- Hinged side panels and driptray, drain(s) 1½" BSP external

- Fitted with schräder valve on the suction connection for testing purposes.
- Refrigerant connections right or left (L=default).
- Sufficient room for fitting the expansion valve inside.
- Suitable for dry expansion or pumped system.
- Stickers indicate fan direction and refrigerant in/out.

2.3 Options

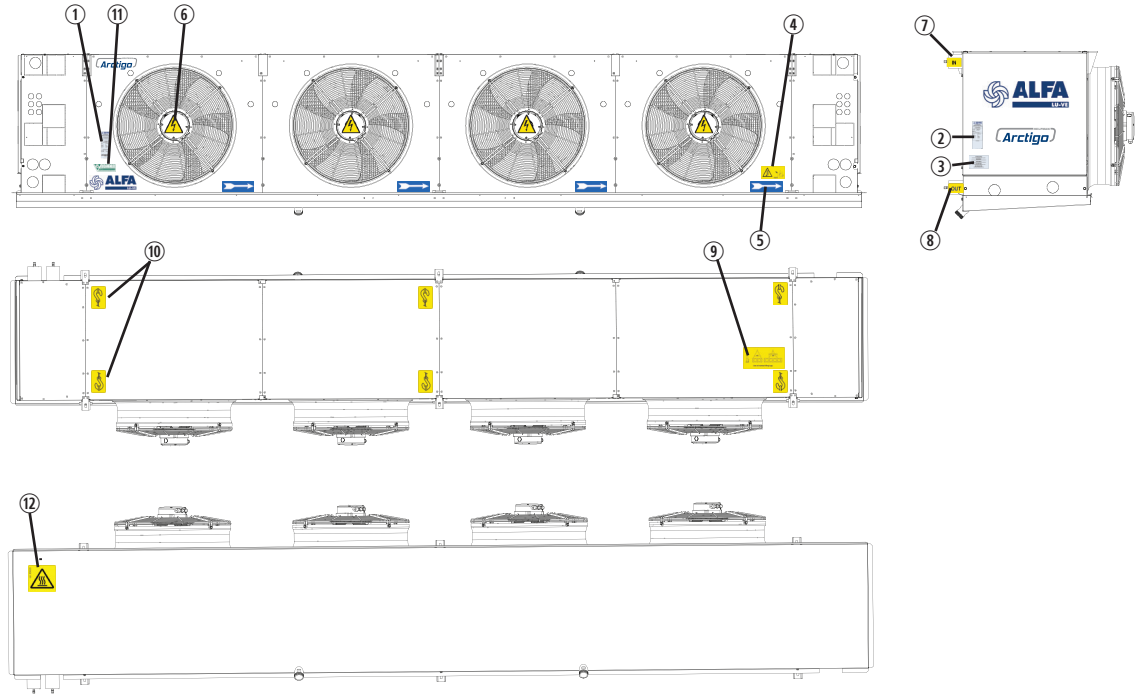
- Connection box (CB)
- Connection box with single switch for all fans (CB1)
- Shut up sock (S)
- Sock Ring (SR)
- Electric defrost systems:
  - Electric defrost in driptray + hot gas in coil (E1)
  - Electric defrost heavy (E2)
  - Electric defrost light (E4)
- Hotgas defrost systems:
  - Hotgas defrost (HG)
  - Hotgas defrost, connected (HGC)
- Hot water defrost (HW)
- Stainless steel casing and coil frame (SSC). Standard materials for underplate (aluminium) and fan grid (black painted steel).
- Alternative fin materials (SWR / EP)
- Dual fin spacing (DF) - on request
- On/off switch (SW)
- Motorized defrost damper
- Threaded connections (T) - for brine models
- Top connections (AVA) - for brine models
- Slip-on flanges aluminium PN16 for copper tubes models or stainless steel PN16 stainless steel tubes models (F) - for brine models
- Fan casing 90° (FC1)
- Fan casing 45° (FC2)
- Suction hood 90° (H1)
- Suction hood 45° (H2)
- Insulated suction hood 90° (IH1)
- Insulated suction hood 45° (IH2)
- Hinged fan ring (HF)
- Insulated drip tray (I2)
- Mounting feet (MF)
- Fan ring heater (FRH)
- Streamer (ST) - not available for 400 and 910 mm fan units

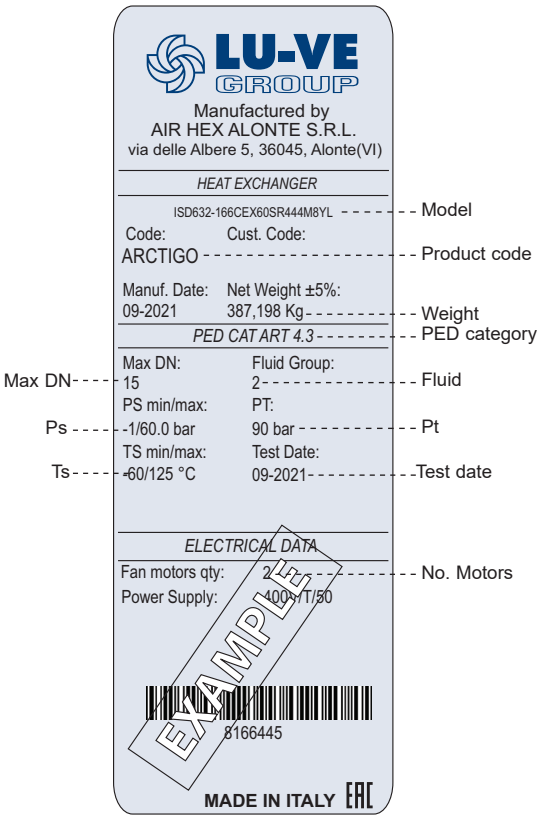
2.4 Code description

ISD	71	1	-	20	S	A	C	E	A	33	AL	7	-	AB	5	4	-	AB	D	-	L	FRH
1	2	3		4	5	6	7	8	9	10	11	12		13	14	15		16	17		18	19

1 Arctigo industrial air cooler single discharge - air direction draw-through
2 Fan diameter (40=400, 45=450, 50=500, 63=630, 71=710, 80=800, 91=910 mm)
3 Number of fans (1 to 6)
4 Tubes per row
5 Coil module (blank=standard coil module, S=short coil module)
6 Tube rows code (A=3 B=4 C=6 D=8 E=10)
7 Tube material (C=copper, S=stainless steel)
8 Application (E=direct expansion, PB=pumped bottom feed, PT=pumped top feed, blank for brine units)
9 Refrigerant system (H=HFC, A=ammonia, W=brine, X=CO_2)
10 Maximum working pressure
11 Fin material (AL=aluminium, EP=precoated aluminium, SWR=sea water resistant aluminium)
12 Fin spacing (4=4.0, 5=5.0, 6=6.0, 7=7.0, 8=8.0, 0=10, 2=12 mm)
13 Number of circuits (2 digits)
14 Capillary diameter (1 digit: for brine and pump there is X, for DX there is 4, 5 or 6)
15 Orifice diameter (mm, only for NH_3 units)
16 Fan motor code (2 digits)
17 Fan digit (D or Y for AC 3ph, S for AC 1ph, E for EC)
18 Refrigerant connection side (L=left, R=right - fan side view)
19 Options

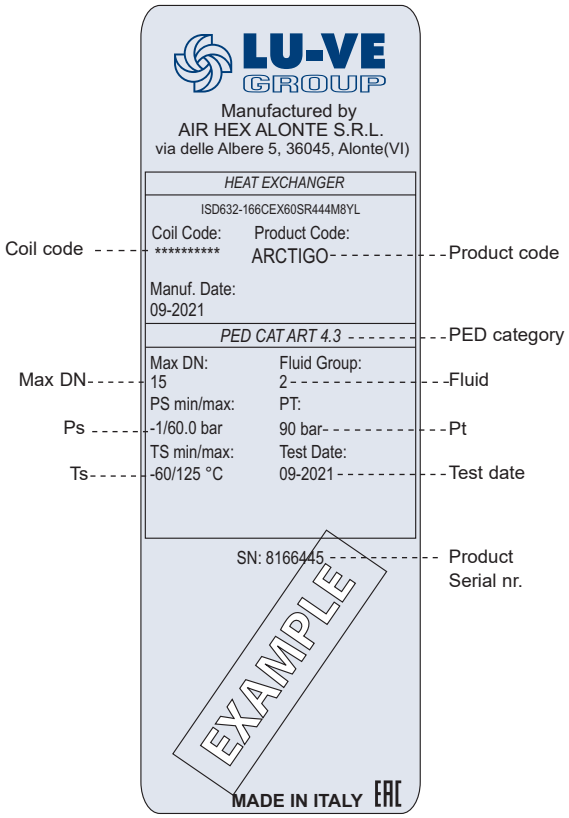
3 Product labels





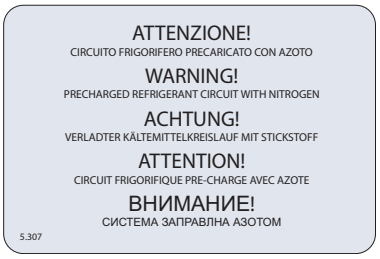
1. Product label

Model	Refer to paragraph "2.4 Code description"
Product code	Communicate this when ordering spare parts as they identify the unit
Unit Net Weight	Check before any lifting operation to ensure that proper lifting tools are used
PED Category	According to PED
Max DN	Maximum diameter of the distributor tube
Fluid	Refrigerant
Ps	Design pressure
Pt	Test pressure
Coil Ts	Range of operating temperatures for the coil
Test date	Date on which the coil has been pressure tested in the factory
No Motors	Number of fans



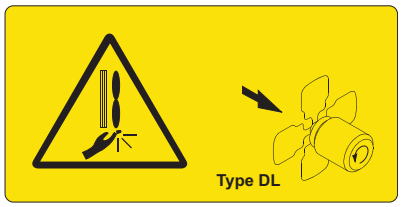
2. Product label - coil

Product code Product serial nr.	Communicate these when ordering spare parts as they identify the unit
PED Category	According to PED
Max DN	Maximum diameter of the distributor tube
Fluid	Refrigerant
Ps	Design pressure
Pt	Test pressure
Coil Ts	Range of operating temperatures for the coil
Test date	Date on which the coil has been pressure tested in the factory



3. Nitrogen precharge warning

Units are delivered from the manufacturer with an overpressure. Check pressure on the Schrader valve. With unpressurised unit: Immediate report to manufacturer and note on bill of delivery.



4. Warning sign for fans and fan type

Airflow direction:
D= draw-through

Rotation direction:
L= left
R= right

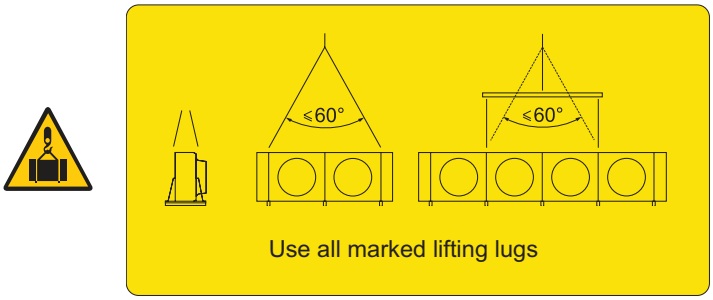
5. Fan rotation

Sticker indicates fan rotation direction.

6. Electrical warning

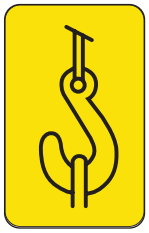
Electrically powered component. Switch off power supply before any maintenance or installation activity.

7/8. In/Out
Refrigerant connections inlet and outlet.



9. Lifting from above

Preferably use hoisting beams when lifting from above.

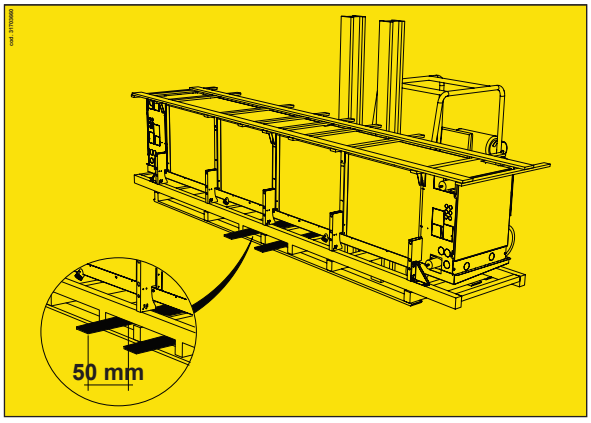


10. Lifting lug
Use all marked lifting lugs when lifting from above.

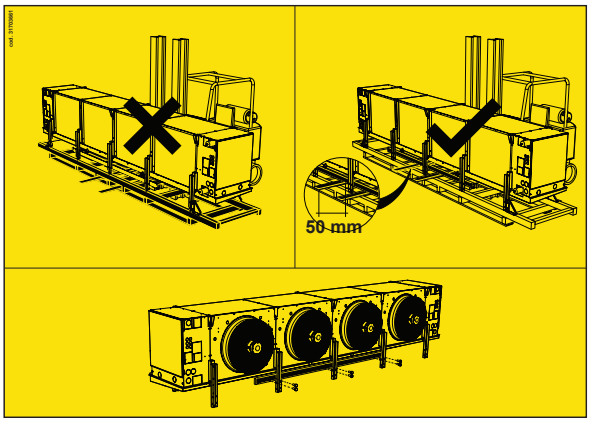
11. Eurovent
Sticker is applied when the product is included in the Eurovent Certify All program.

12. Hot surface
Danger of burns. Wear adequate protection.

Forklift
Sticker is applied on the pallet or on horizontal beam (MF option). Insert forks where indicated.



Unit handling - standard unit
Sticker is applied on the packing.

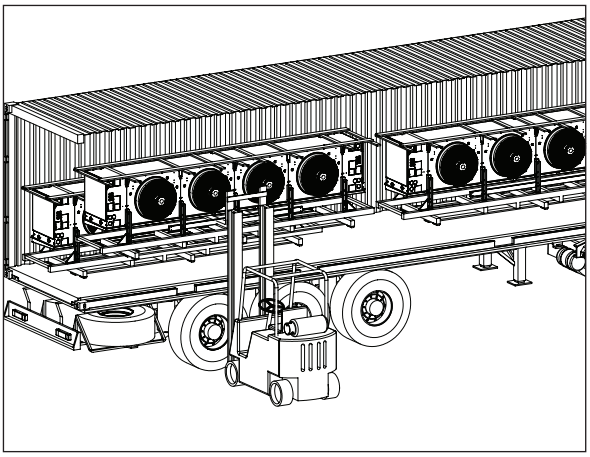


Unit handling - MF option
Sticker is applied on the packing.

4 Unpacking and lifting

Always follow guidelines and instructions as given in the air cooler product manual AHE00042.

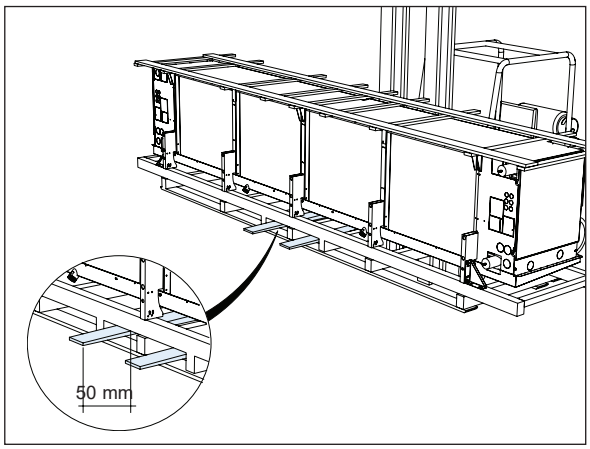
Arctigo air coolers are delivered in mounting position, mounted on wooden beams. Handling and positioning can take place with use of a forklift.



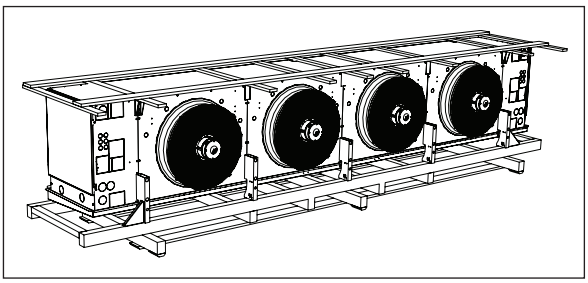
When more coolers are delivered in a single shipment, packed air coolers may be stacked during transportation (max. 2 units). Packed air coolers are to be unloaded one by one. Units must be unloaded and handled only from the long side, one at a time.

When possible, casing options are supplied mounted on the unit. In such cases this warning might be present on one side the unit packaging. In order to ensure safe lifting, the unit must be loaded on the heavier side i.e. the one where this warning sign is not present.

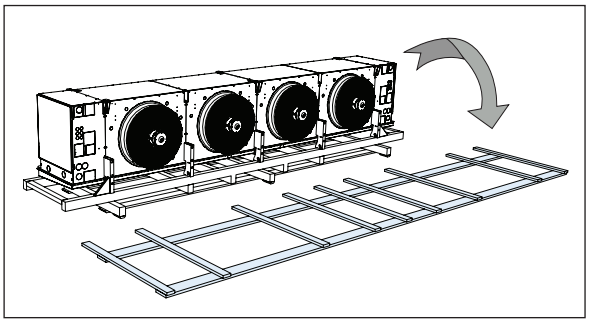
4.1 Standard unit



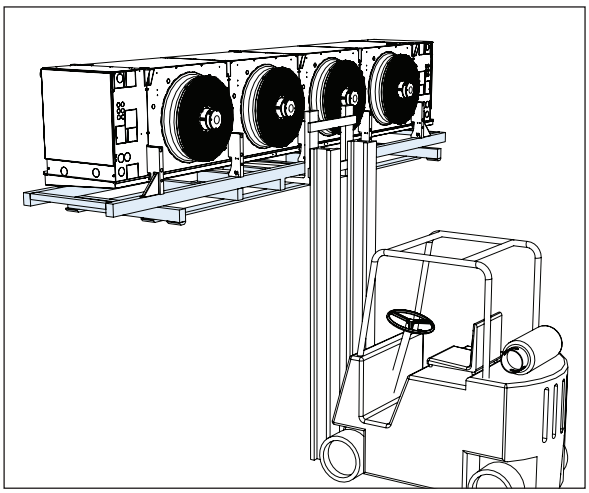
Insert the forks under the lower pallet.
In order to avoid damage to the driptray or falling of the unit, ensure that the lifting forks cover all beams from the lower support pallet.



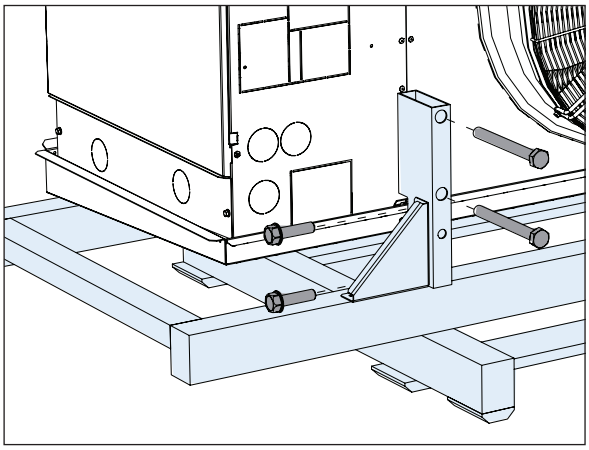
Place the unit on the ground and loosen the fixing materials from the top pallet.



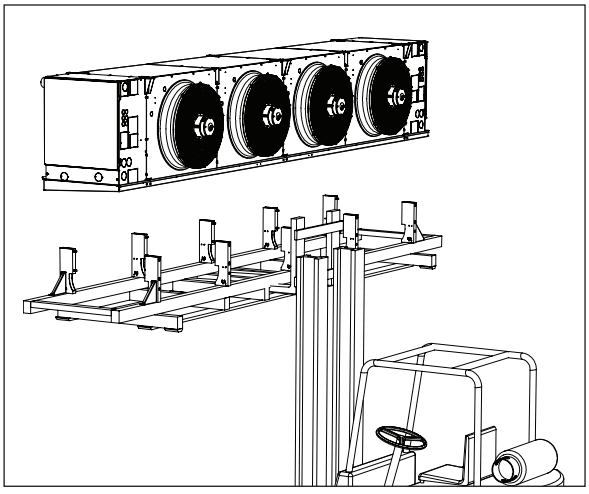
Remove the top pallet.



Insert the forks under the lower pallet.
Lift the unit into mounting position and secure following instructions given in chapter "5 Installation".



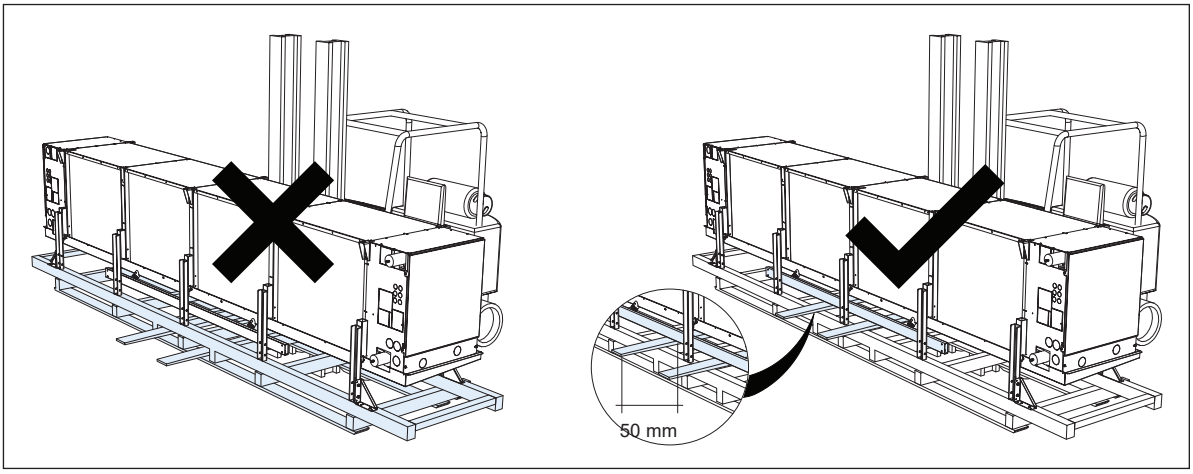
Once the unit is secured in the installation position, loosen the fixing materials from the lower support pallet.

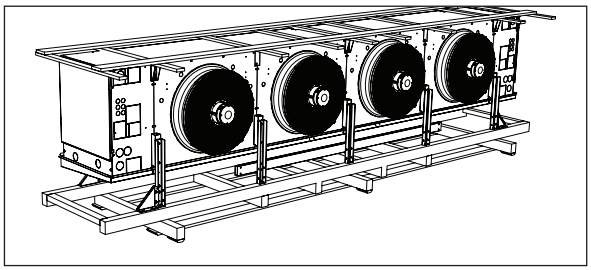


Remove pallet.

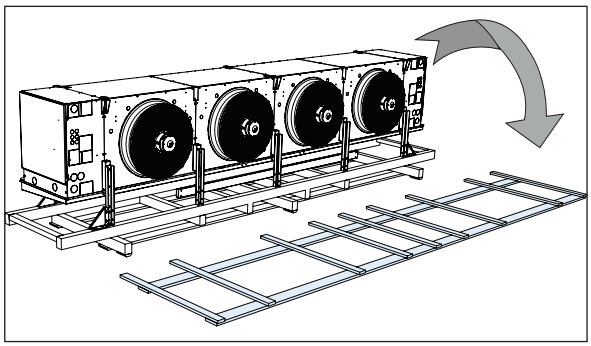
4.2 Unit with mounting feet (optional)

In order to avoid damage to the driptray while handling, packing of units with mounting feet includes horizontal beams under the unit. Insert the forks under the horizontal beams.
Ensure that the lifting forks cover the horizontal beams.

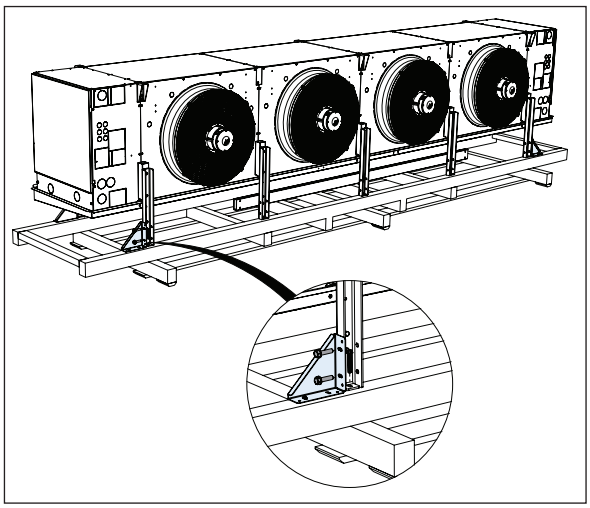




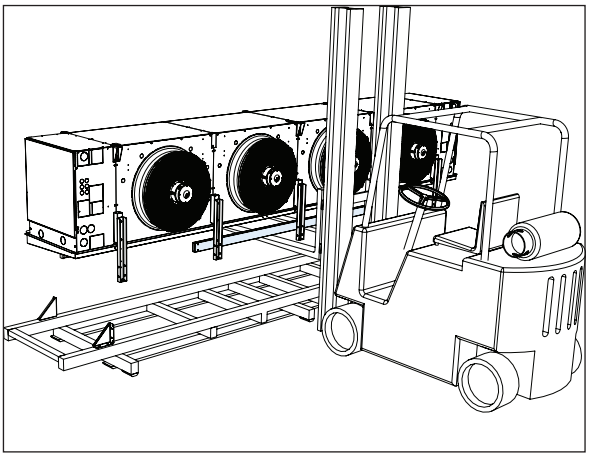
Place the unit on the ground and loosen the fixing materials from the top pallet.



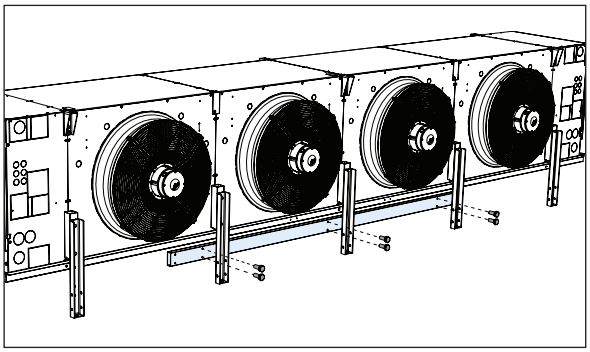
Remove the top pallet.



Unscrew the fixing materials from the lower support pallet and support triangles.

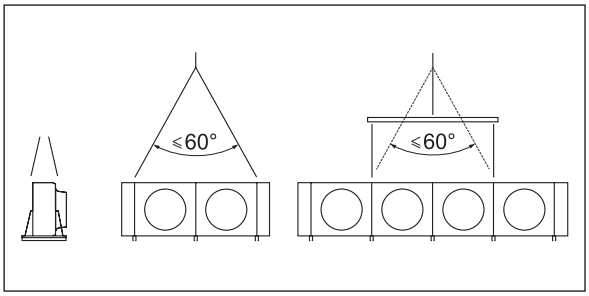


Handle and position the unit by inserting the forks under the horizontal beams.



Once the unit is positioned, unscrew and remove the horizontal beams to allow easier maintenance and grant driptray accessibility.

4.3 Lifting from above



When unit lifting from above is required, follow the lifting instructions in the air cooler product manual AHE00042.

5 Installation

Always follow guidelines and instructions as given in the air cooler product manual AHE00042.

5.1 Assembly

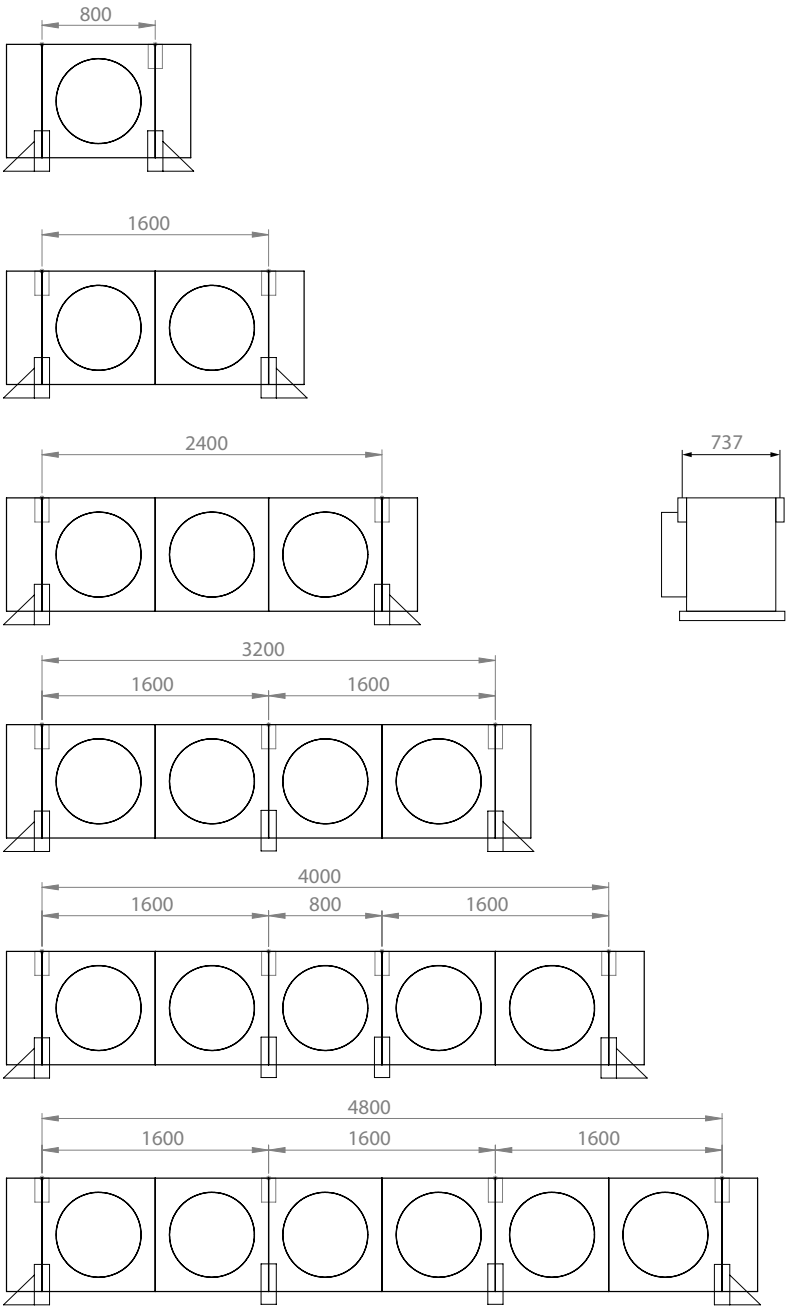
Air cooler units may be delivered as separate components that need to be assembled on site. This could occur when casing options like suction hoods are selected, causing the unit to exceed the maximum width for transportation by truck (240 cm). Depending on handling conditions on site, assembly should take place either before or after mounting the unit to the final installation position. When supplied in components, assembly instructions are included with the air cooler unit.

5.2 Mounting dimensions

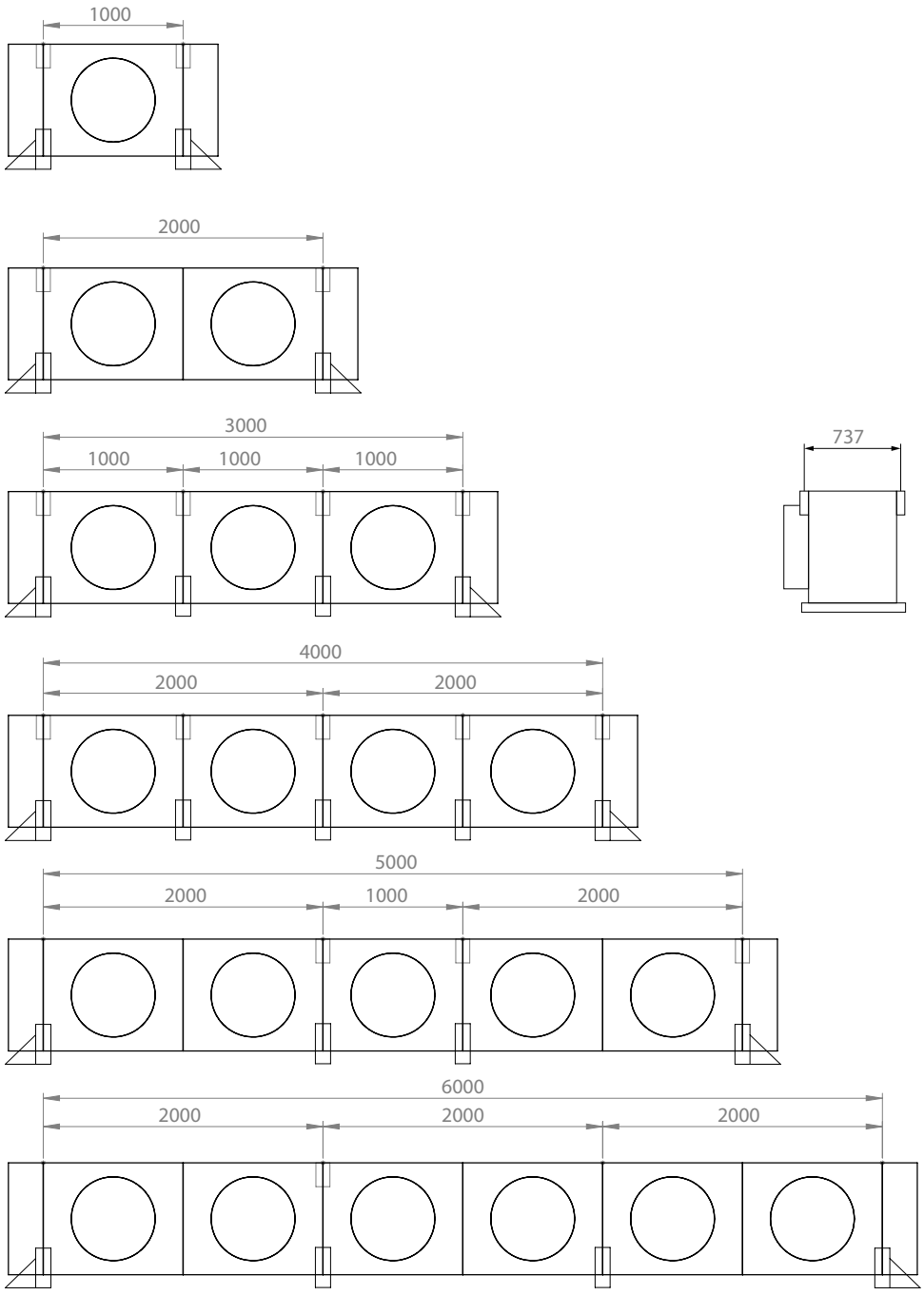
Detailed drawings showing all required mounting and refrigerant connection dimensions are available for download on alfa.luvegroup.com.

Dimensional drawings
Arctigo ISD

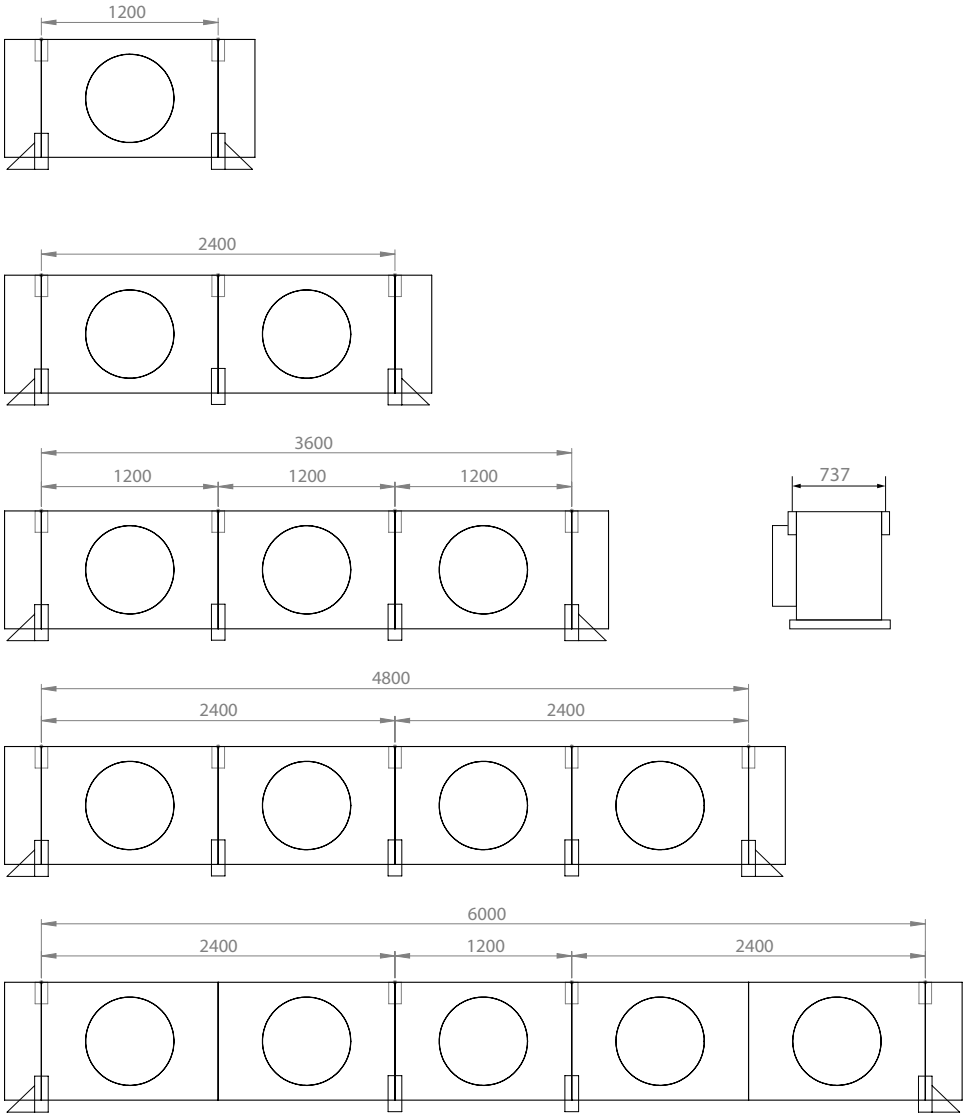
ISD 40-45S



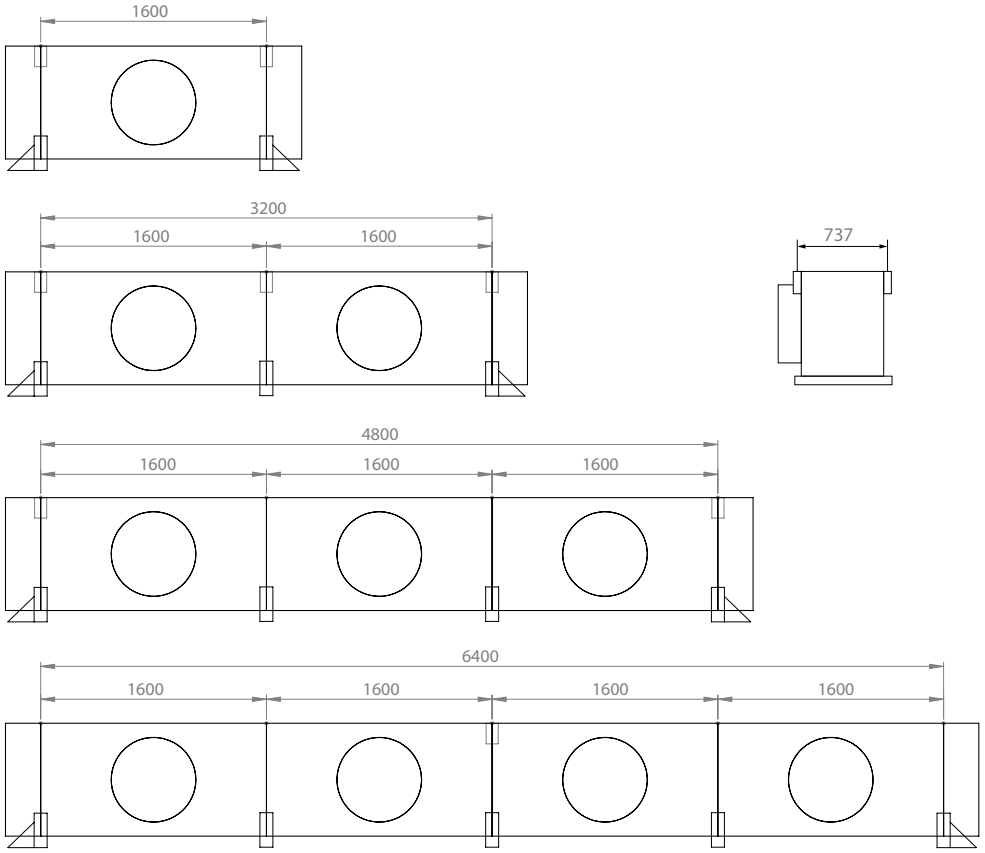
ISD 45-50-63S



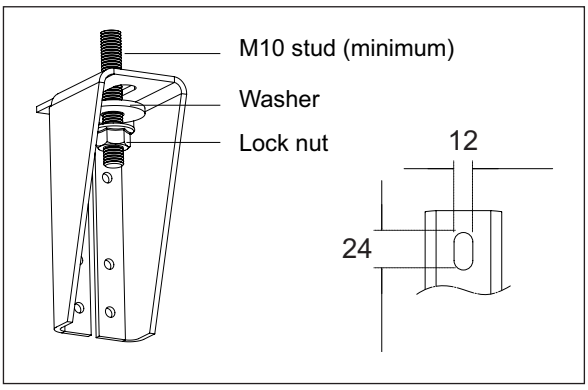
ISD 63-71



ISD 80-91-91S



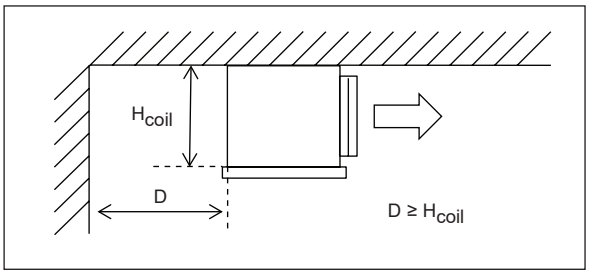
5.3 Mounting bracket



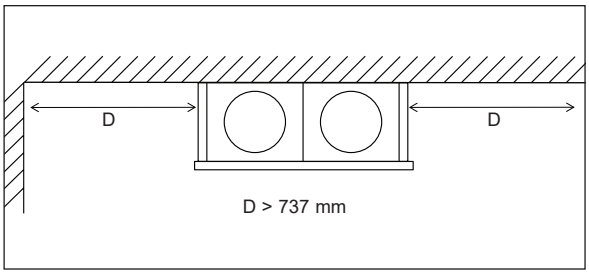
Use extra wide washer (ISO 7093) when mounting the unit to the ceiling.
Avoid any lateral torque on the mounting brackets.

5.4 Technical spaces

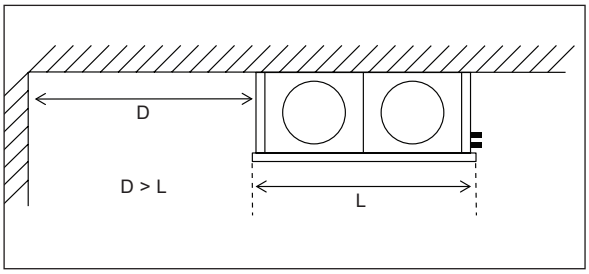
The following guidelines are to be respected when positioning air cooler units.



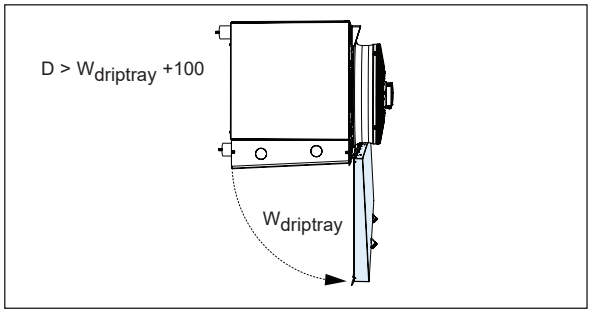
Minimum wall distance on suction side.



Minimum space for side panels opening.



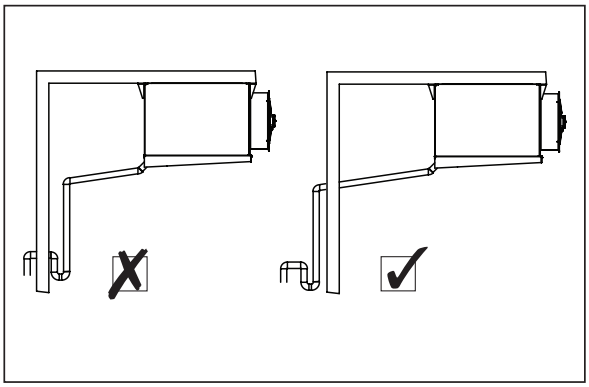
Minimum space for defrost heater replacement (optional). Side for defrost elements extraction is opposite to the connections.



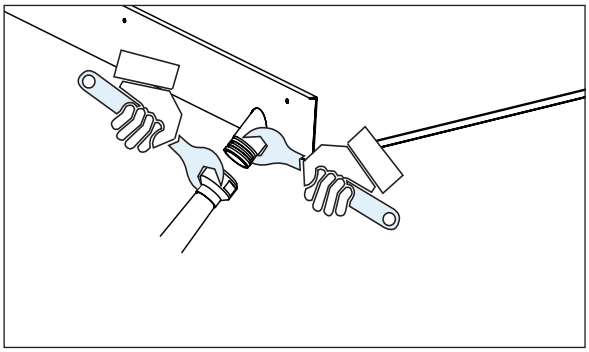
Adequate spacing for driptray opening shall be left below the cooler.

5.5 Drain line

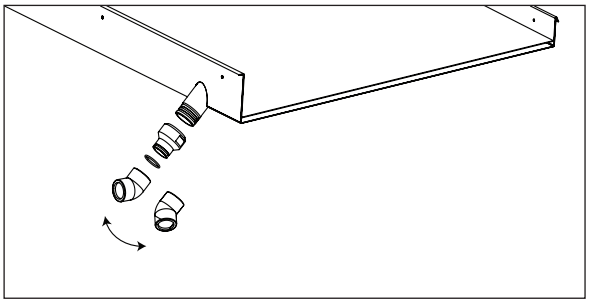
The drain line diameter must be at least the size of the driptray drain diameter and should be laid with an adequate slope. For room temperatures below 0° C drain line insulation and an internal or external heating element are required to prevent freezing.



A syphon must be installed on the drain line, outside the cold room.



Tighten drain connection by using two wrenches. Keep wrenches firmly to not strain on connection welding.



Optional drain kit for PVC click-on connection including adapter, O-ring and 40 mm 45° PVC connection, freely adjustable into either horizontal or vertical position.

5.6 Electrical connections

The following data determine which connection diagram is to be selected and respected for electrical installation:

- Heat exchanger model indication
- Fan motor type
- Electrical options

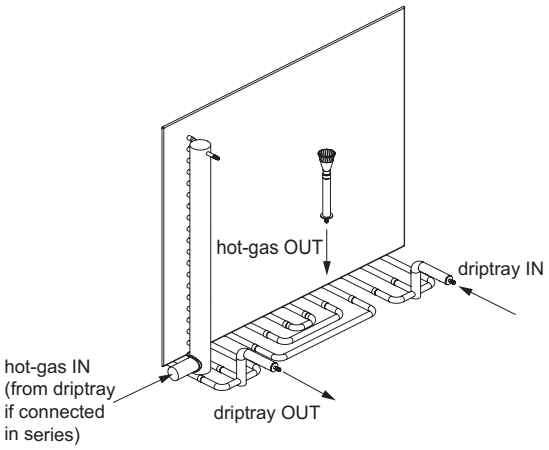
Electrical connections
Arctigo ISD

Electrical connection diagrams are available for download on alfa.luvegroup.com.
When in doubt always contact your local Alfa LU-VE representative for assistance.

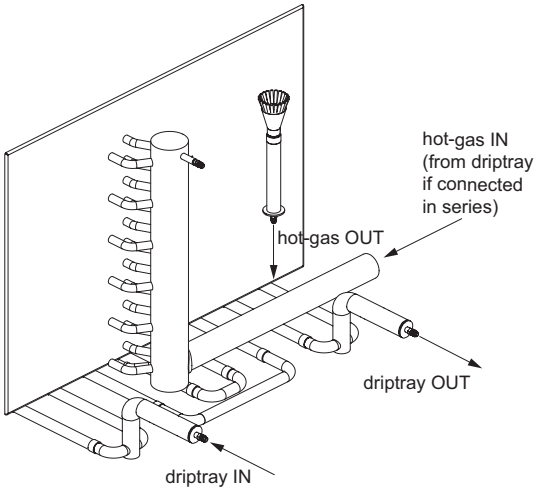
5.7 Hot-gas defrost

An oil separator (not included in the scope of supply) shall be installed in the piping before the hot-gas defrost inlet to avoid oil circulation and accumulation throughout the hot-gas circuit.

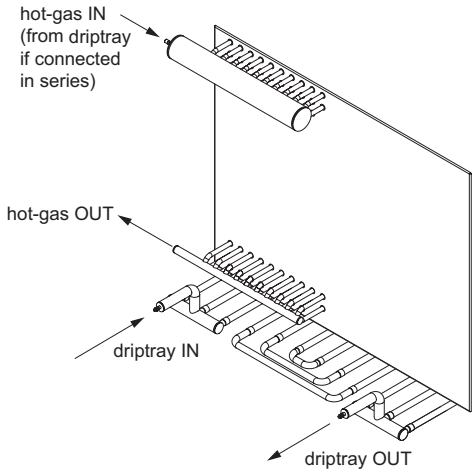
ISD direct expansion



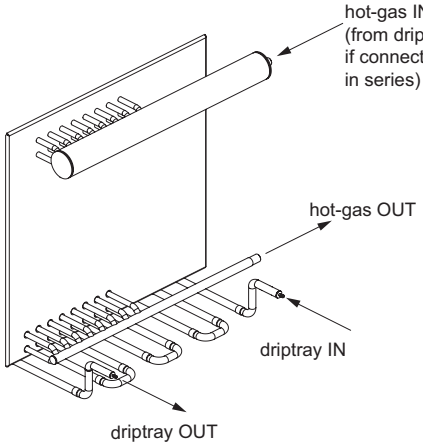
ISB direct expansion



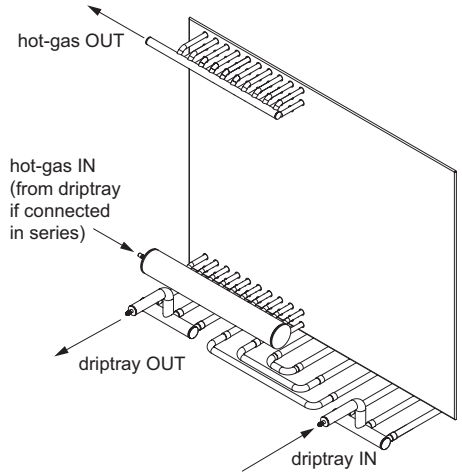
ISD pumped, bottom feed



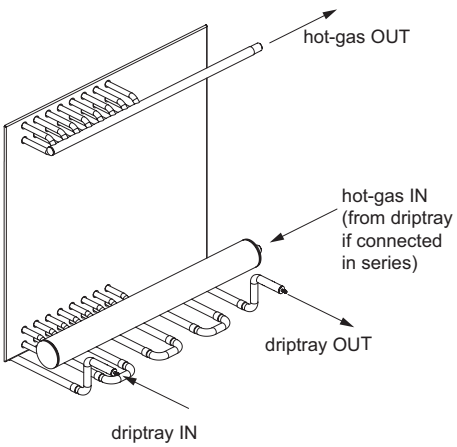
ISB pumped, bottom feed



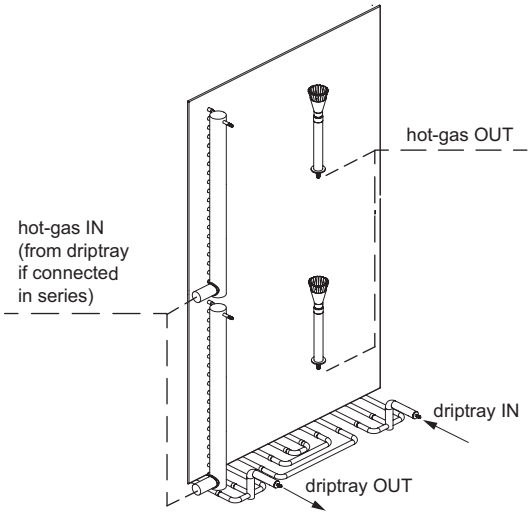
ISD pumped, top feed



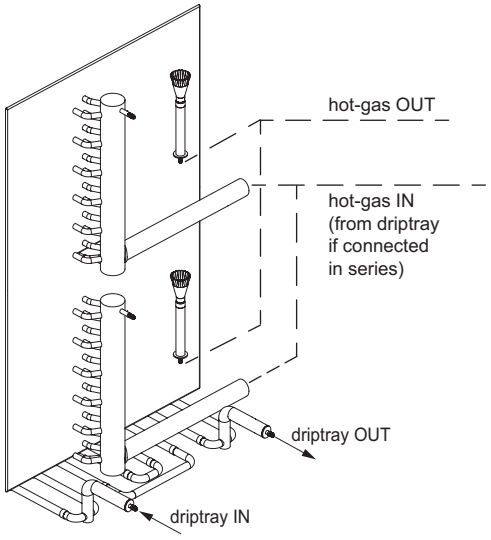
ISB pumped, top feed



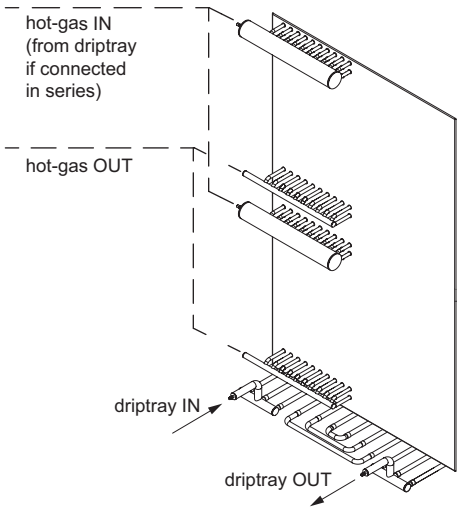
ISD direct expansion, 4 connections



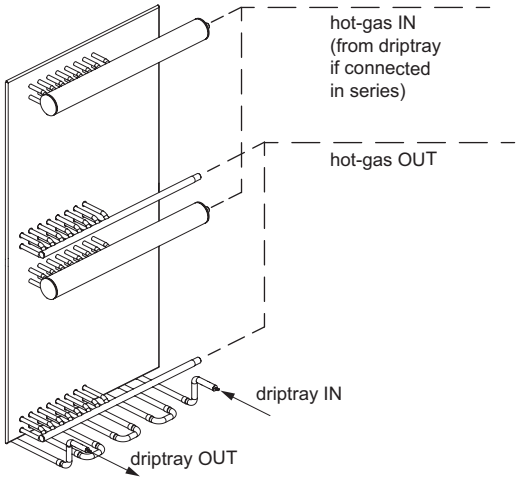
ISB direct expansion, 4 connections



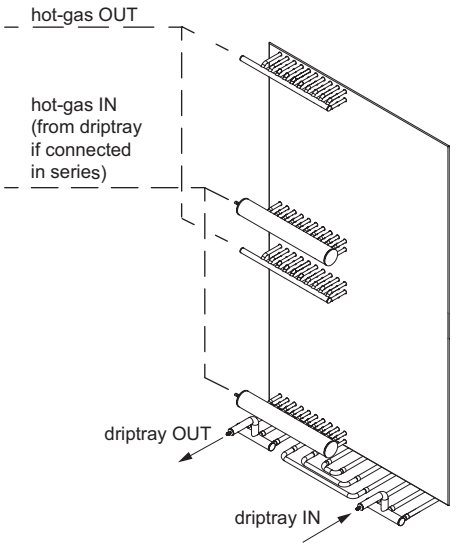
ISD pumped, bottom feed, 4 connections



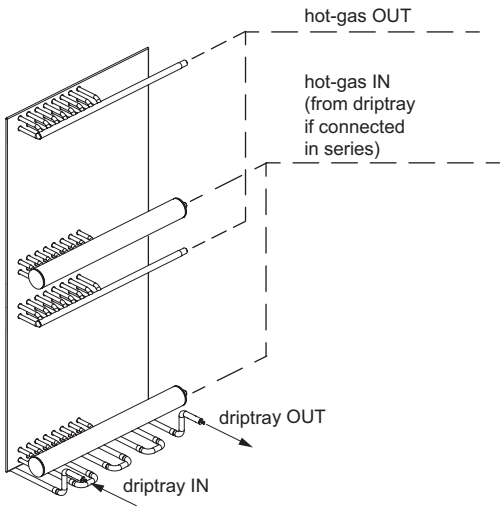
ISB pumped, bottom feed, 4 connections



ISD pumped, top feed, 4 connections

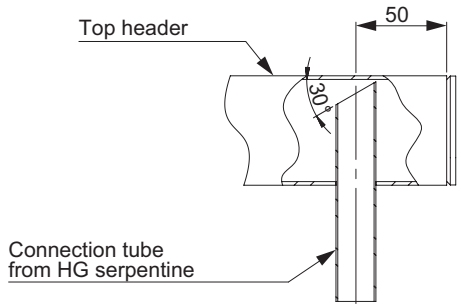


ISB pumped, top feed, 4 connections

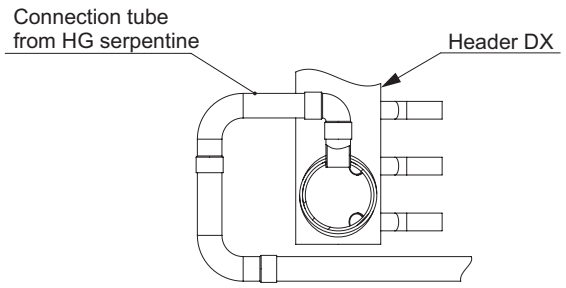


If driptray and coil defrost are connected in series we recommend that hot-gas passes first trough the driptray. Connection as below are recommended to avoid liquid recirculation.

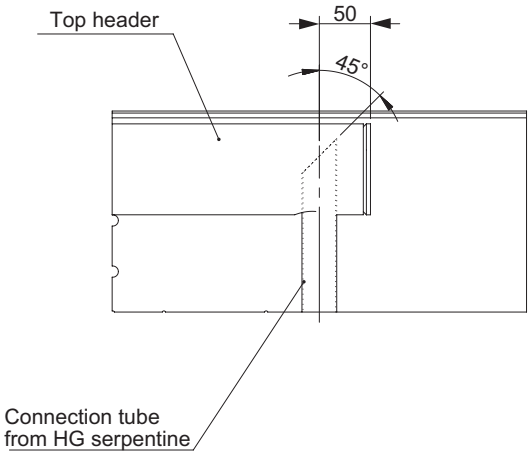
ISB pumped, bottom feed



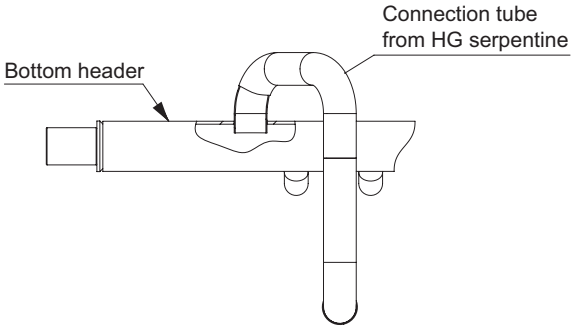
ISB/ISD direct expansion



ISD pumped, bottom feed

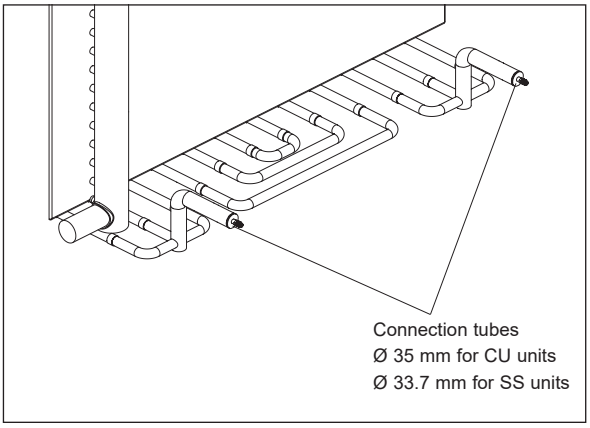


ISB/ISD pumped, top feed



5.8 Hot gas and hot water connection

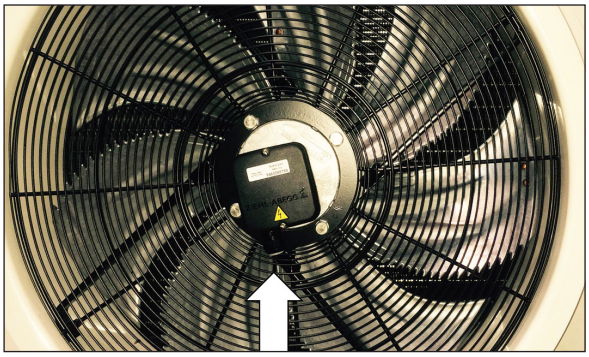
Standardized connection diameters are Ø 35 mm for copper tubes or Ø 33.7 mm for stainless steel tubes.



6 Maintenance

Ensure complete electrical isolation before performing any maintenance activity and always follow guidelines and instructions as given in the air cooler product manual AHE00042.

6.1 Fan replacement

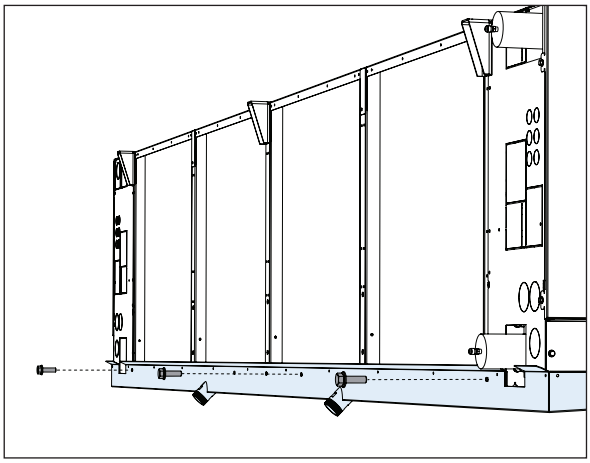


Cable glands must be positioned downwards.

Use an anti-corrosion coating like Geomet or comparable when remounting using new fixing bolts.

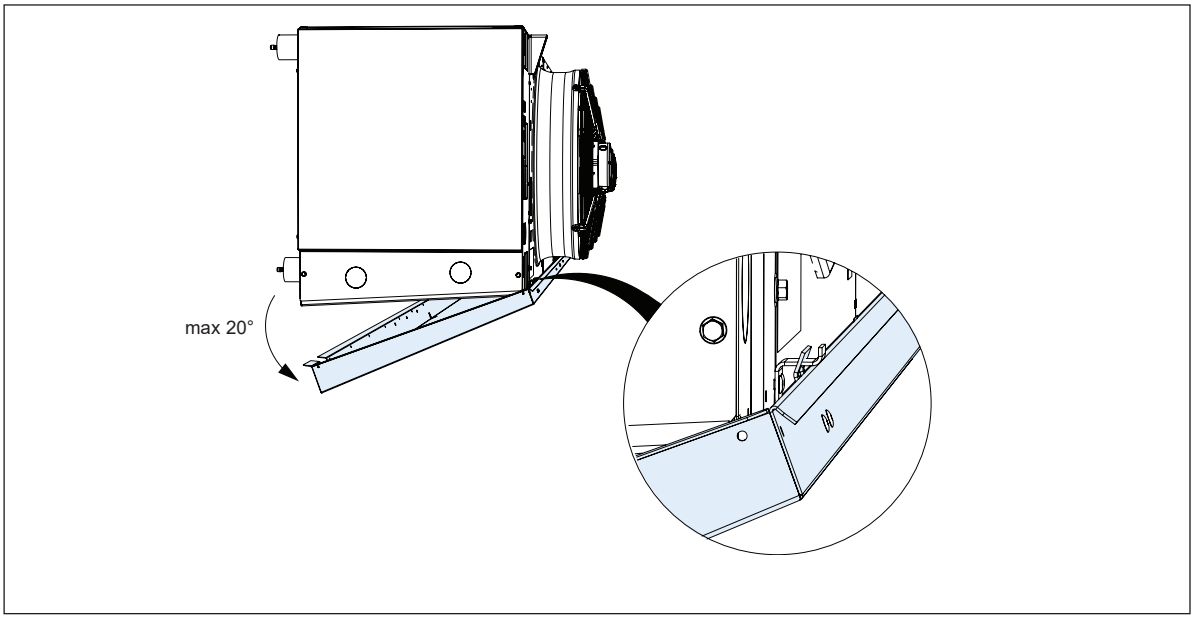
6.2 Driptray

Always disconnect drain line before opening the driptray.

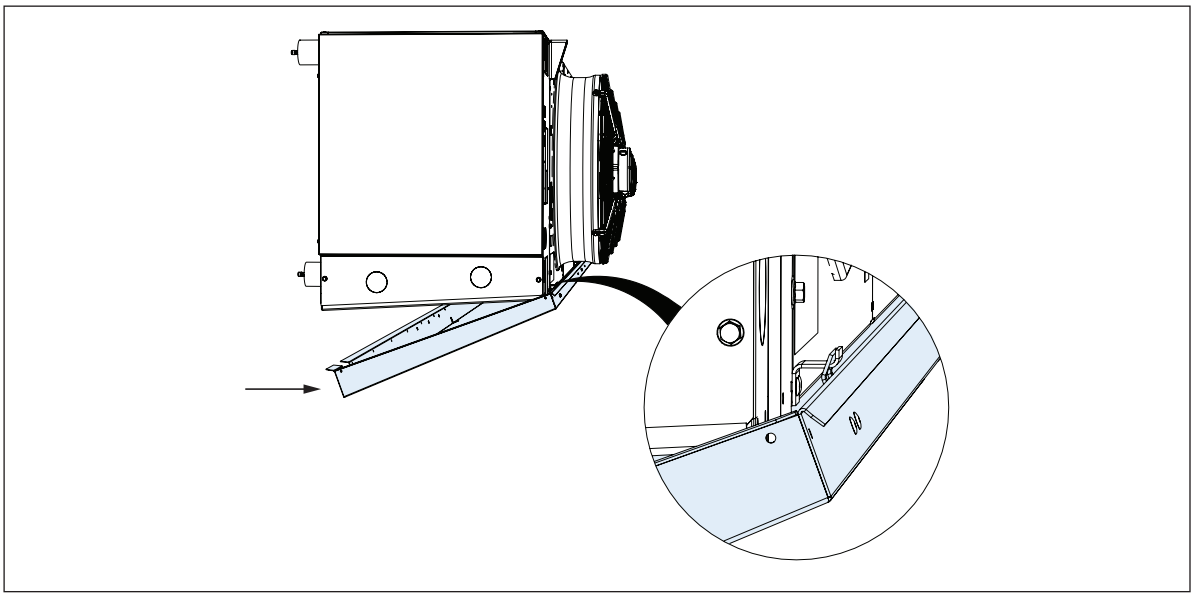


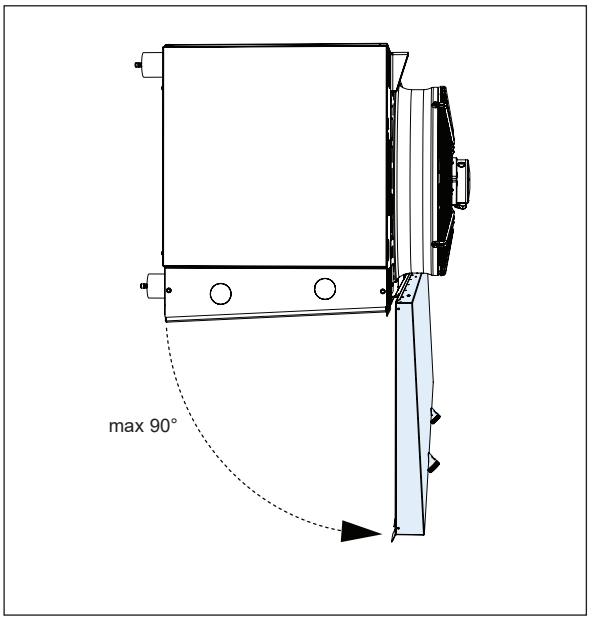
To open driptray, first loosen and remove fixing bolts.

Slightly lower the driptray.



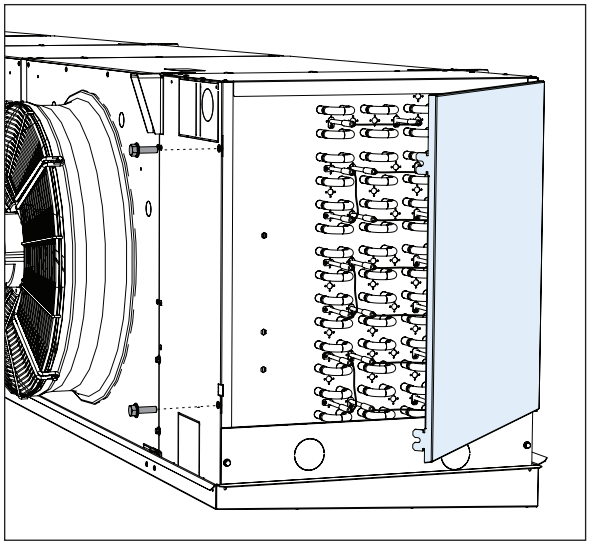
Push the driptray till the end of hinges.





Completely lower the driptray.
Respect the maximum opening angle to avoid damage to the driptray hinges.

6.3 Side covers



Hinged side covers can be opened for inspection, cleaning and maintenance purposes. This can only be done by qualified personnel. To open side covers, loosen fixing bolts.

6.4 Coil defrost heater elements replacement (optional)

Before handling heater elements always:
• disconnect power supply
• ensure heaters are at ambient temperature.

To remove heater elements, remove the fixing screw and the plate, if any. Extract element from coil. Mount new element in reverse order and restore electrical connections.

screw - opposite to connections side

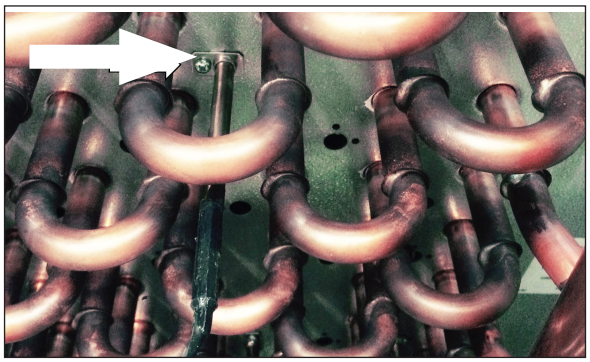
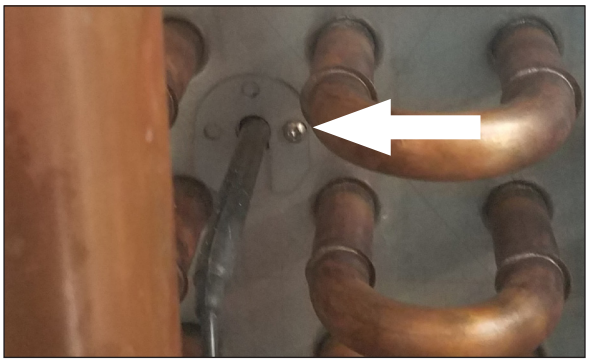


plate - connections side



6.5 Driptray heater elements replacement (optional)

Before handling heater elements always:
• disconnect power supply
• ensure heaters are at ambient temperature

To remove heater elements, open the driptray and remove the fixings. Extract elements. Mount new element in reverse order and restore electrical connections.

6.6 Shut up sock mounting (optional)

When shut up sock option is selected, shut up ring is supplied assembled.

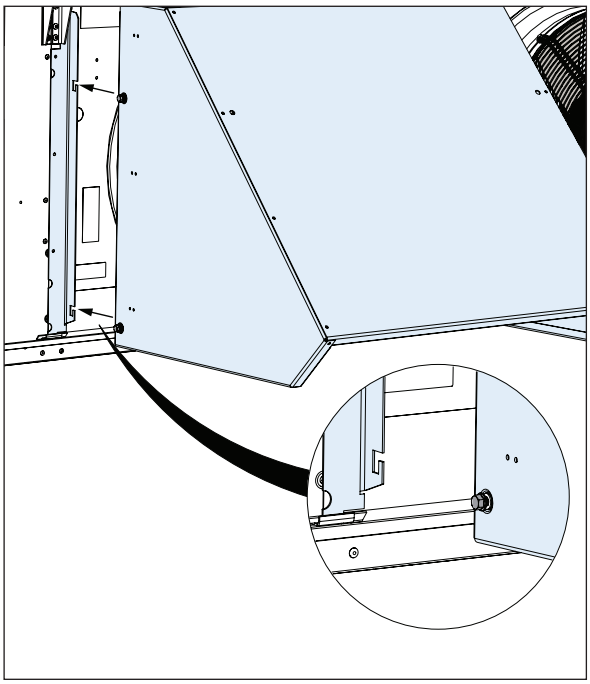
Position the shut up sock such that the belt is mechanically blocked by the rounding on the sock ring.

Slacken the shut upsock belt. Let the sock overlap the sock ring. Fasten the belt.

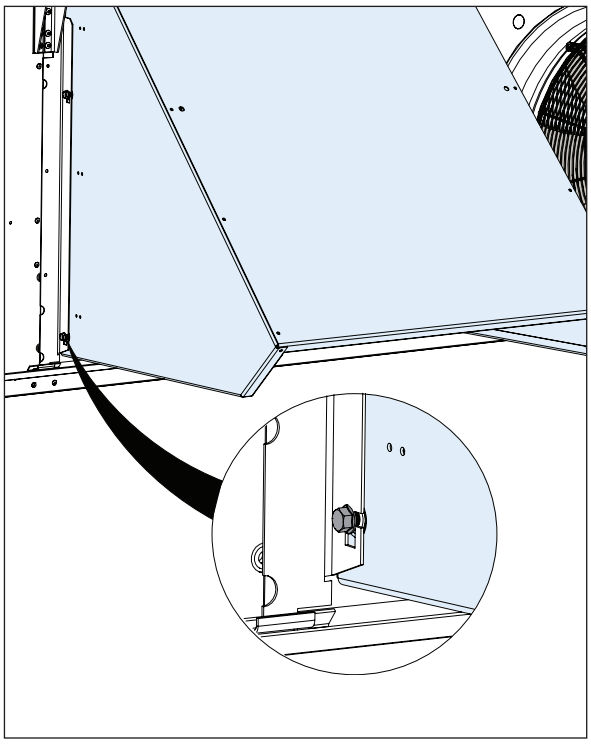
Fasten again the belt, tighter. Test tightness to verify correct mounting.

6.7 Suction hoods mounting (optional)

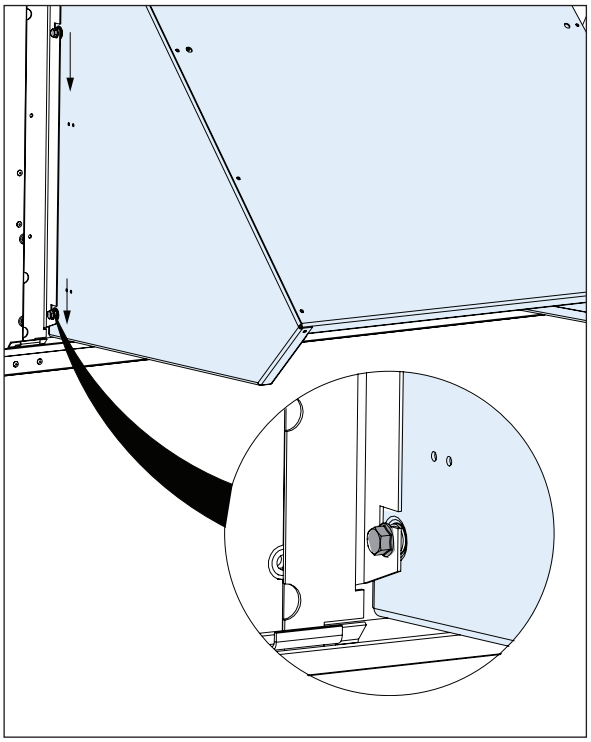
Suction hoods shall be assembled before mounting the unit to the ceiling.
Place the suction hoods on air inlet side (coil side).



Place 2 screws per side.

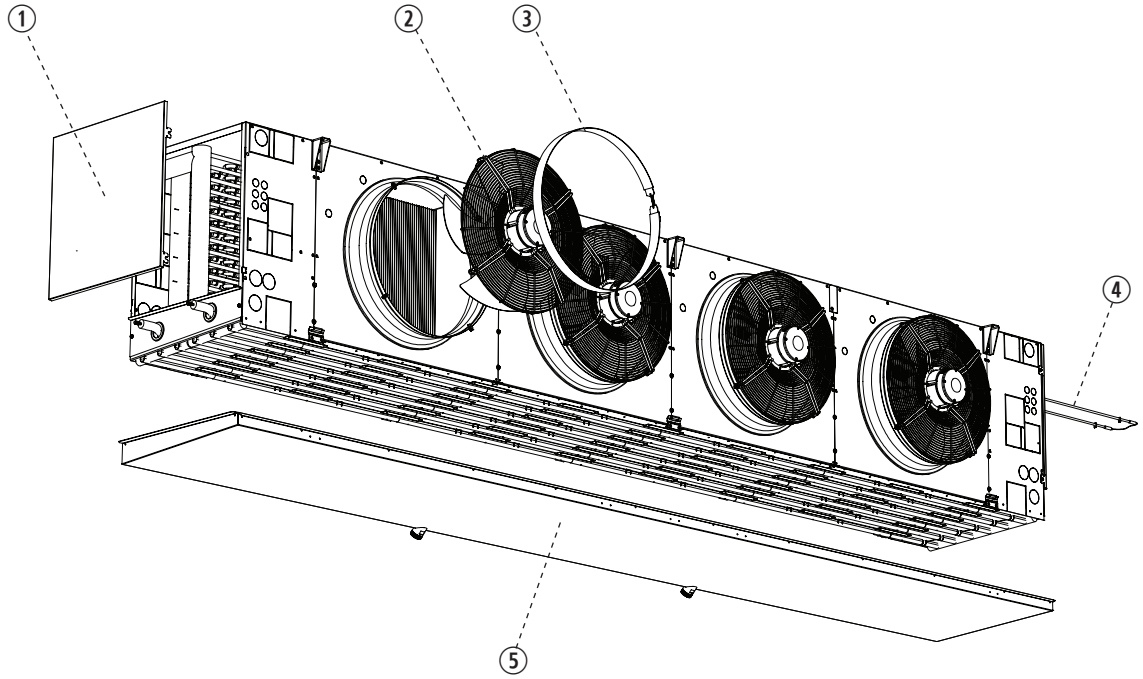


Slot the screws into the sockets.



Tighten the 2 screws per side.

7 Spare parts



Spare parts

①	Side panel
②	Fan motor
③	Fan ring heater (FRH)
④	Defrost heater - identical for coil and driptray
⑤	Driptray

Contact your local Alfa LU-VE representative for spare parts order and assistance.

alfa.luvegroup.com